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Sir:

Attached please find the application papers of Tomomi OKAMOTO, Kyuichiro NAGAI, Atsushi INOUE, Hiroaki ONO covering new and useful improvements in DISC CARTRIDGE, comprising:

Specification, Seven (7) Claims and Abstract of the Disclosure (21 pages)

English language, Combined Declaration and Power of Attorney (2 pages)

Thirteen (13) Sheets of Drawings Showing Figures 1, 2A-2C, 3A-3B, 4, 5A-5C, 6A-6B, 7A-7C, 8A-8B, 9-13

Assignment and Recording of Assignment Letter

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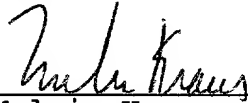
Letter Claiming Right of Priority and Certified Copy of Japanese Patent Application No.10-118111

Information Disclosure Sheet Under 37 CFR 1.56 with Copies of Indicated Documents

Please charge any shortages in the fees or credit any overpayments thereof the deposit account of Antonelli, Terry, Stout & Kraus, LLP Account No. 01-2135 (500.37153X00).

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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Attachments

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DISC CARTRIDGE

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a disc cartridge which receives a disc-like recording medium such as an optical disc, a photomagnetic disc and the like therewithin.

Description of the Prior Art

Conventionally, the discs such as the optical disc and the like are used for a disc-like recording medium. These discs are frequently used in a state of being received within the disc cartridge for the purpose of preventing a recording or reproducing error due to an attachment of oils and fats on a recording surface thereof.

In this case, the disc-like recording medium is structured such that in the case that a recording density is fixed, a recording capacity of course becomes greater as a diameter thereof becomes greater. On the contrary, in the case of using the disc-like recording medium mentioned above as a recording medium for a portable recording and reproducing apparatus, for example, a video camera and the like, a compact disc is excellent in portability.

Accordingly, there is a case that the disc used for a portable apparatus has a different diameter from the disc used for a stationary apparatus. At this time, a small-sized disc cartridge is of course used for a disc cartridge

used for the portable disc. In the case that a recording method is the same and only a shape of the disc is different, if it is possible to mount the disc to the recording and reproducing apparatus, it is possible to
5 record or reproduce by means of recording and reproducing means provided in the recording and reproducing apparatus. Therefore, it is possible to record and reproduce the disc used for the portable apparatus in the stationary recording and reproducing apparatus by taking out only the disc from
10 the compact disc cartridge and replacing in the disc cartridge having the same outer shape as that of the disc cartridge in the stationary apparatus.

Further, in an optical disc, a recording operation is sensitive to a dirt and a reproducing
15 operation is relatively strong to a dirt, so that in the case of performing only a reproducing operation without again performing a recording operation in the once recorded disc, there exists a system in which a disc is taken out from the disc cartridge and only the disc can be treated.

20 Because of the reasons mentioned above, there is a requirement of inserting and removing the disc with respect to the disc cartridge. As a structure of taking out the disc from the disc cartridge, for example, there is a method of arranging a disc insertion and removal portion
25 in a part of the disc cartridge as shown in Japanese Patent Unexamined Publication No. 5-242626.

A description will be given of a structure for taking out the disc from the disc cartridge in accordance

with the conventional art with reference to Fig. 9. A disc
insertion and removal port 12 is provided on a surface
opposite to a surface on which a shutter 3 is arranged, and
a disc insertion and removal port opening and closing
5 member 10e is arranged there. Normally, the disc insertion
and removal port opening and closing member 10e is
structured such that a locking hook 6e is fitted to a
locking hole 7e arranged in the disc cartridge, and the
disc insertion and removal port 12 is closed. At a time of
10 taking out a disc 4, the locking hook 6e is removed from
the locking hole 7e and the disc insertion and removal port
opening, closing member 10e is rotated around a rotational
support point 8e and the disc insertion and removal port 12
is opened, so that the disc 4 is inserted and removed.

15 Further, another conventional embodiment is shown
in Fig. 10. In the conventional embodiment shown in Fig.
10, a disc insertion and removal port opening and closing
member 10f is structured such as to be capable of being
taken out from the disc cartridge 1. Further, at a time of
20 attaching the disc insertion and removal port opening and
closing member 10f, the disc insertion and removal port
opening and closing member 10f is locked by a fitness
between a locking hook 6f and a locking hole 7f, thereby
preventing an erroneous falling off.

25 Still further, the other conventional embodiment
is shown in Fig. 11. In the conventional embodiment shown
in Fig. 11, in the same manner as that of the embodiment
shown in Fig. 10, a disc insertion and removal opening and

closing member 10g is structured such as to be capable of being taken out from the disc cartridge 1. Further, at a time of attaching the disc insertion and removal port opening and closing member 10g, the disc insertion and removal port opening and closing member 10g is locked by a fitness between a locking hook 6g and a locking hole 7g. It is structured such that the disc 4 can be taken out of the disc cartridge 1 by a disc auxiliary member 2 arranged in the disc insertion and removal port opening and closing member 10g at a time of taking out the disc insertion and removal opening and closing member 10g.

Furthermore, the other conventional embodiment is shown in Fig. 12. In the conventional embodiment shown in Fig. 12, in the same manner as that of the embodiments shown in Figs. 10 and 11, a disc insertion and removal opening and closing member 10h is structured such as to be capable of being taken out from the disc cartridge 1. Further, at a time of attaching the disc insertion and removal port opening and closing member 10h, the disc insertion and removal port opening and closing member 10h is locked by a fitness between a locking hook 6h and a locking hole 7h. It is structured such that the disc 4 can be taken out of the disc cartridge 1 in a state of being held by a disc holding member 5 arranged in the disc insertion and removal port opening and closing member 10h when taking out the disc insertion and removal opening and closing member 10h.

In the disc cartridge as mentioned above, in the case of using the disc cartridge receiving disc once taken out therewithin in the recording and/or reproducing apparatus corresponding to the cartridge, it is necessary that the apparatus detects the fact of being taken out. This is necessary for the purpose of inhibiting a recording operation of the disc which has been taken out to an outer portion or more frequently performing a recording check since a recording operation is sensitive to a dirt in the optical disc as mentioned above. A method of detecting a history of taking out the disc will be described below with reference to Fig. 13. Fig. 13 shows a structure of opening and closing the disc insertion and removal port 12 by a disc insertion and removal port opening and closing member 10i in the same manner as that of the embodiment shown in Fig. 9, thereby inserting and removing the disc. A locking hook 6i and a locking hole 7i are fitted to each other and the locking member 11 is fitted to the locking hole 9, whereby a locking of the disc insertion and removal port opening and closing member 10i is performed. When the locking hook 6i is removed from the locking hole 7i, the locking hook 6i is elastically deformed in an inner direction of the disc cartridge, so that a fitting can be again performed even after once removed. On the contrary, when removing the locking member 11 from the locking hole 9, the locking member 11 is broken out from the disc insertion and removal port opening and closing member 10i.

When opening the disc insertion and removal port opening and closing member 10i, it is necessary to release these two kinds of locking means, however, when opening the disc insertion and removal port opening and closing member 10i, 5 the locking member 11 becomes in a broken state, so that it is possible to recognize a history of taking out the disc by detecting the broken state.

As mentioned above, in the conventional art, when taking out the disc from the disc cartridge, the disc take- 10 out history is definitely left in the disc cartridge.

However, as a purpose of taking out the disc, in addition to the case of using a simple disc exclusively for reproducing the disc, there is a case of using the disc with moving the disc between the disc cartridges. In this 15 case, since a user does not positively handle the disc, there is a little possibility that a dirt is attached to the disc surface. Further, it can be avoided to be directly in contact with the disc by closely attaching the insertion and removal ports of the disc cartridge to each 20 other and moving the disc, so that a dirt is not attached. Even in this case, when the disc take-out history is left, an impossible recording treatment or an excessive recording check is performed although no dirt is attached to the disc, so that a usability of the disc is deteriorated.

25 SUMMARY OF THE INVENTION

An object of the present invention is to provide a disc cartridge structured such that a history of taking

5 movement of the disc between the disc cartridges.

10 and closing member, and locking means for locking the
insertion and removal port opening and closing member when
the insertion and removal port opening and closing member
is closed and locking cancellation preventing means for
preventing the locking means from canceling the locking of
15 the insertion and removal port opening and closing member
are arranged in the disc cartridge.

20 exposed to an outer portion of the disc cartridge.

25 portion of the disc cartridge.

Furthermore, at least a part of the locking cancellation preventing means is arranged on a moving path necessary for the locking means to cancel the locking.

Moreover, the locking cancellation preventing means is irreversibly displaced out of the moving path from the moving path of the locking means and the locking means is made movable so as to cancel the locking.

5 Further, the locking cancellation preventing means is irreversibly displaced out of the moving path from the moving path of the locking means and the locking means is moved in a state of displacing the locking cancellation preventing means so as to cancel the locking.

10 Still further, the history of the insertion and removal of the disc can be recognized by detecting the state of the locking cancellation preventing means.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Fig. 1 is a schematic view of a first embodiment in accordance with the present invention, which shows a structure of a disc cartridge;

Fig. 2 is a schematic view of the first embodiment in accordance with the present invention, which
20 shows a structure of locking means and locking cancellation preventing means of disc insertion and removal port opening and closing means;

Fig. 3 is a schematic view of the first embodiment in accordance with the present invention, which
25 explains a method of locking and removing the locking means of the disc insertion and removal port opening and closing means without breaking the locking cancellation preventing means;

Fig. 4 is a schematic view of a second embodiment in accordance with the present invention, which shows a structure of a disc cartridge;

Fig. 5 is a schematic view of the second
5 embodiment in accordance with the present invention, which shows a structure of locking means and locking cancellation preventing means of disc insertion and removal port opening and closing means;

Fig. 6 is a schematic view of the second
10 embodiment in accordance with the present invention, which explains a method of locking and removing the locking means of the disc insertion and removal port opening and closing means without breaking the locking cancellation preventing means;

Fig. 7 is a schematic view of a third embodiment in accordance with the present invention, which shows a structure of locking means and locking cancellation preventing means of disc insertion and removal port opening and closing means;

Fig. 8 is a schematic view of the third
20 embodiment in accordance with the present invention, which explains a method of locking and removing the locking means of the disc insertion and removal port opening and closing means without breaking the locking cancellation preventing
25 means;

Fig. 9 is a schematic view of a conventional art, which shows a structure of inserting and removing a disc in a disc cartridge;

Fig. 10 is a schematic view of a conventional art, which shows a structure of inserting and removing a disc in a disc cartridge;

Fig. 11 is a schematic view of a conventional art, which shows a structure of inserting and removing a disc in a disc cartridge;

Fig. 12 is a schematic view of a conventional art, which shows a structure of inserting and removing a disc in a disc cartridge; and

Fig. 13 is a schematic view of a conventional art, which shows a structure of a history of taking out a disc in a disc cartridge.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Embodiments in accordance with the present invention will be described below with reference to Figs. 1 to 8.

A first embodiment in accordance with the present invention will be described below with reference to Figs. 1 to 3. Fig. 1 is a schematic view which shows an internal structure of a disc cartridge in accordance with the first embodiment of the present invention. As shown in Fig. 1, a disc cartridge 1 is provided with a disc insertion and removal port through which a disc 4 passes when inserting and removing the disc 4. When the disc cartridge 1 receives the disc 4 therewithin, a disc insertion and removal port opening and closing member 10a is locked to the disc insertion and removal port 12 by locking means.

The locking means in accordance with the present embodiment is constituted by a locking hook 6a and a locking hole 7a and is structured such that the locking hook 6a is fitted to the locking hole 7a, thereby being locked. In this
5 case, the locking hole 7a is structured such as not to pass through, and such that it is impossible to cancel the locking from an outer portion of the disc cartridge 1 through the locking hole 7a.

In Fig. 2, a locking state of the locking means
10 and a method of canceling the locking will be described. Fig. 2 is a schematic view which shows details of a locking cancellation preventing member 16a corresponding to the locking means and the locking cancellation preventing means. When the disc insertion and removal port opening
15 and closing member 10 is attached to the disc cartridge 1, the locking hook 6a is fitted and locked to the locking hole 7a as shown in Fig. 2A. Further, since the locking cancellation preventing member 16a is arranged in a lower portion of the locking hook 6a, the locking hook 6a is
20 hardly exposed to an outer portion, so that it is hard for a user of the disc cartridge to take out the locking hook 6a from the locking hole 7a in this state. When the user takes out the disc from the disc cartridge 1 for the purpose of using the disc as a single one, the locking
25 cancellation preventing member 16a is broken as shown in Fig. 2B. The locking hook 6a is exposed to an outer portion by breaking the locking cancellation preventing member 16a so as to take out, so that it is possible to

remove the locking hook 6a. In this case, the take-out history is recognized by detecting the breakage of the locking cancellation preventing member 16a. Further, in the case that it is not desired to mark the disc take-out history such as a movement of the disc between the disc cartridges, the disc is taken out by removing the locking hook 6a without breaking the locking cancellation preventing member 16a as shown in Fig. 2C.

A description will be given of a method of removing the locking hook 6a without breaking the locking cancellation preventing member 16a with reference to Fig. 3. An opening portion 19a which is small enough that the user can not operate the locking hook 6a by a finger is provided between the locking cancellation preventing member 16a and the disc cartridge 1. The locking hook 6a is moved by inserting the locking cancellation member 18a from the opening portion 19a, as shown in Fig. 3B, thereby being removed from the locking hole 7a. A locking cancellation member 18a is, for example, provided near the disc insertion and removal portion of the disc cartridge in a destination for the disc, so that a cancellation of the locking and a moving operation of the disc can be both performed by pressing the disc cartridge 1 in accordance with the present invention.

Next, a second embodiment in accordance with the present invention will be described below with reference to Figs. 4 to 6. Fig. 4 is a schematic view which shows a structure of a disc cartridge in accordance with the second

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embodiment of the present invention. The present
embodiment has the disc insertion and removal port 12 in
the same manner as that of the first embodiment, and when
the disc cartridge 1 receives the disc 4 therewithin, a
5 disc insertion and removal port opening and closing member
10j is locked to the disc insertion and removal port 12 by
locking means. The locking means in accordance with the
present embodiment is also constituted by a locking hook 6j
and a locking hole 7j, and the locking hook 6j is fitted to
10 the locking hole 7j so as to be locked. Further, in the
case of the disc cartridge which has not taken out the
disc, the structure is made such that the disc cartridge 1
and the locking cancellation preventing member 16j cover
almost all of the member having the locking hook 6j. In
15 this case, the locking hole 7j is not penetrated, so that
it is structured such that it is impossible to cancel the
locking by inserting into the locking hole 7j from the
outer portion of the disc cartridge 1.

A description will be given of a locking state of
20 the locking means and a method of canceling the locking
with reference to Fig. 5. Fig. 5 is a schematic view which
shows a detail of the locking cancellation preventing
member 16j corresponding to the locking means and the
locking cancellation preventing means. Left views in Figs.
25 5A to 5C are outside drawings near a portion in which the
locking cancellation preventing member 16j is arranged, and
right views show an inner structure thereof. When the disc

insertion and removal port opening and closing member 10j
is attached to the disc cartridge 1, the locking hook 6j is
fitted and locked to the locking hole 7j as shown in Fig.
5A. Further, since the disc cartridge 1 and the locking
5 cancellation preventing member 16j cover almost all of the
surface in the member having the locking hook 6j, it is
hard for the user of the disc cartridge to remove the
locking hook 6j from the locking hole 7j. In order that
the user uses the disc as a single unit, it is necessary to
10 break the locking cancellation preventing member 16j,
expose a lower portion of the member having the locking
hook 6j to an outer portion and displace the portion in a
direction of an arrow so as to take out the locking hook
6j, as shown in Fig. 5B. In this case, the disc apparatus
15 recognizes the disc take-out history of the disc cartridge
1 by detecting the breakage of the locking cancellation
preventing member 16j. Further, in the case that it is not
desired to mark the disc take-out history such as a
movement of the disc between the disc cartridges, the disc
20 is taken out by removing the locking hook 6j without
breaking the locking cancellation preventing member 16j as
shown in Fig. 5C.

Next, a description will be given of a method of
removing the locking hook 6j without breaking the locking
25 cancellation preventing member 16j with reference to Fig.
6. An opening portion 19j which is small enough that the
user can not operate the locking hook 6j by a finger is
provided between the locking cancellation preventing member

16j and the disc cartridge 1. The locking hook 6j is moved by inserting the locking cancellation member 18j from the opening portion 19a, as shown in Fig. 6B, thereby being removed from the locking hole 7j. A locking cancellation member 18j is, for example, provided within the disc cartridge in a destination for the disc, so that the disc is moved by moving the locking cancellation preventing member 18j and canceling the locking after pressing the disc cartridge 1 in accordance with the present invention.

Further, in the case of the present embodiment, as is different from the first embodiment, the locking cancellation preventing member 16j is exposed to a front surface of the disc cartridge or a back surface thereof. Accordingly, it is possible to detect the take-out history from the surface of the disc cartridge 1 or the back surface thereof, so that it is possible to increase a freedom in designing an arrangement of a sensor in the side of the disc apparatus.

Next, a third embodiment in accordance with the present invention will be described below with reference to Figs. 7 and 8. Fig. 7 is a schematic view which shows a locking state of locking means and a method of canceling the locking in accordance with the third embodiment of the present invention. The locking hook 6b is fitted to the locking hole 7b so as to perform the locking in the same manner as that of the first embodiment. Further, in order to take out the locking hook 6b from the locking hole 7b, it is necessary to move in an inner direction of the disc

cartridge 1, however, a locking cancellation preventing member 16b is arranged on the moving path. In this state, the locking hook 6b is interfered with the locking cancellation preventing member 16b and can not be moved, so
5 that the locking can not be cancelled. When taking out the disc from the disc cartridge 1 in order that the user uses the disc as a single unit, the locking cancellation preventing member 16b is broken as shown in Fig. 7B. the locking hook 6b can be moved by breaking the locking
10 cancellation preventing member 16b so as to take out, so that it is possible to take out the locking hook 6b. In this case, the disc apparatus recognizes the disc take-out history by detecting the breakage of the locking cancellation preventing member 16b. Further, in the case
15 that it is not desired to mark the disc take-out history such as a movement of the disc between the disc cartridges, the locking cancellation is performed by elastically deforming the locking cancellation preventing member 16b and moving the locking hook 6b in this state, as shown in
20 Fig. 7C.

A description will be given of a method of taking out the locking hook 6b while deforming the locking cancellation preventing member 16b with reference to Fig. 8. It is necessary that a deformation of the locking
25 cancellation preventing member 16b and a movement of the locking hook 6b are performed substantially at the same time. Accordingly, as shown in Fig. 8A, by pressing a locking cancellation member 18b having a fork-like front

end portion to the locking hook 6b and the locking
cancellation preventing member 16b, it is possible to move
the locking hook 6b while deforming the locking
cancellation preventing member 16b as shown in Fig. 8B so
5 as to be taken out from the locking hole 7b. The locking
cancellation member 18b is, for example, provided near a
disc insertion and removal port of the disc cartridge in a
destination for the disc, and a cancellation of the locking
and a moving operation of the disc can be both performed by
10 pressing the disc cartridge 1 in accordance with the
present invention.

As mentioned above, the present invention can
provide the disc cartridge structured such that a history
of taking out the disc is left in the disc cartridge in the
15 case that the user takes out the disc and uses the disc as
a single unit, and a history of taking out the disc is not
left in the disc cartridge in a state that the user does
not positively perform a handling of the disc such as a
movement of the disc between the disc cartridges.

20 In accordance with the structure mentioned above,
in the case that the user takes out the disc and uses the
disc as a single unit, a history of taking out the disc is
left in the disc cartridge, and in a state that the user
does not positively perform a handling of the disc such as
25 a movement of the disc between the disc cartridges, a
history of taking out the disc is not left in the disc
cartridge.

preventing means covers to an outer portion of said disc cartridge.

4. A disc cartridge as claimed in claim 1, wherein at least a part of said locking cancellation preventing means is arranged on a moving path necessary for said locking means to cancel the locking.

5. A disc cartridge as claimed in claim 4, wherein said locking cancellation preventing means is irreversibly displaced out of the moving path from the moving path of said locking means and said locking means is made movable so as to cancel the locking.

6. A disc cartridge as claimed in claim 4, wherein said locking cancellation preventing means is irreversibly displaced out of the moving path from the moving path of said locking means and said locking means is made movable in a state of displacing said locking cancellation preventing means so as to cancel the locking.

7. A disc cartridge as claimed in claim 3 or 5, wherein the history of the insertion and removal of said recording medium can be recognized by detecting the state of said locking cancellation preventing means.

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ABSTRACT OF THE DISCLOSURE

In the case that the user takes out the disc and uses the disc as a single unit, a history of taking out the disc is left in the disc cartridge, and in a state that the user does not positively perform a handling of the disc such as a movement of the disc between the disc cartridges, a history of taking out the disc is not left in the disc cartridge. A cartridge of the invention is provided with locking means for locking an insertion and removal port opening and closing member which opens and closes a disc insertion and removal port, and locking cancellation preventing means for preventing the locking means from canceling the locking.

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FIG.1

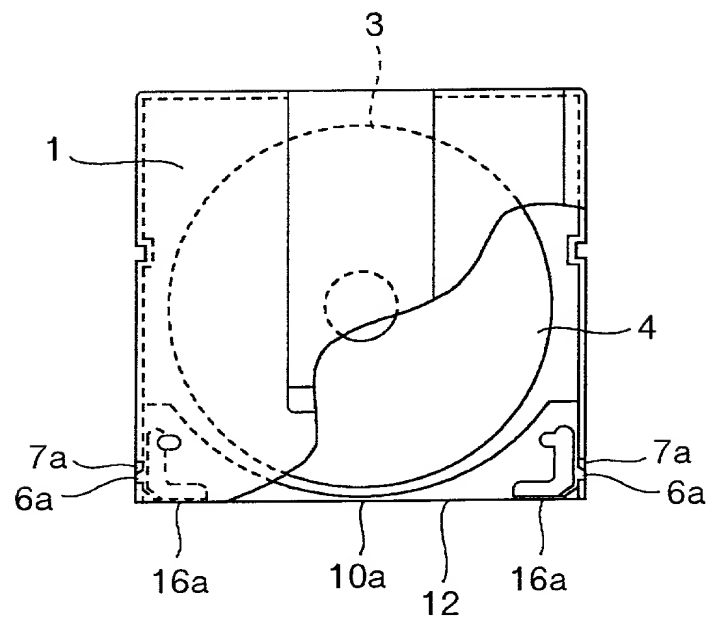


FIG.2A

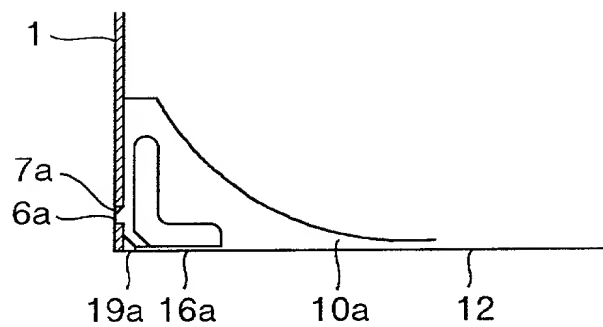


FIG.2B

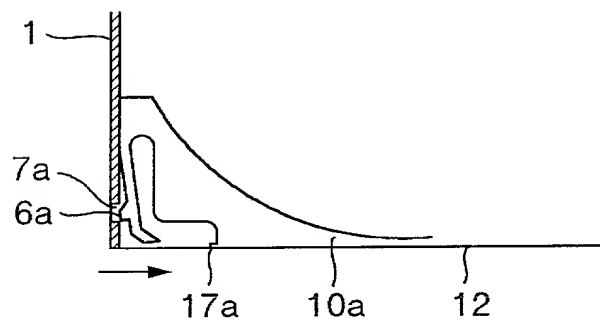


FIG.2C

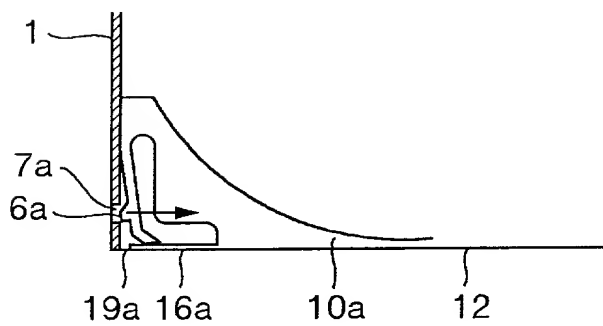


FIG.3A

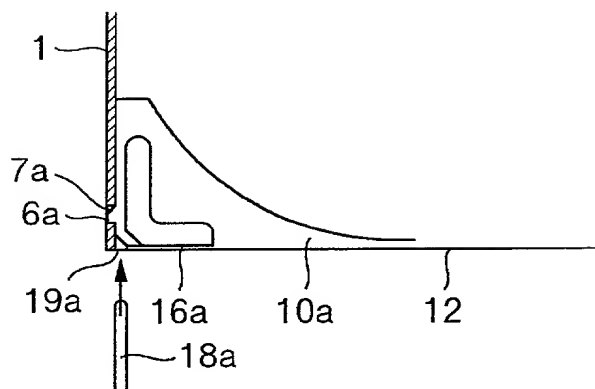


FIG.3B

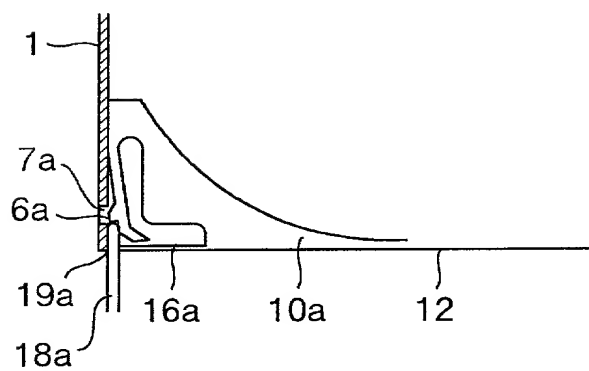


FIG.4

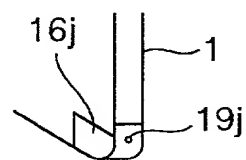
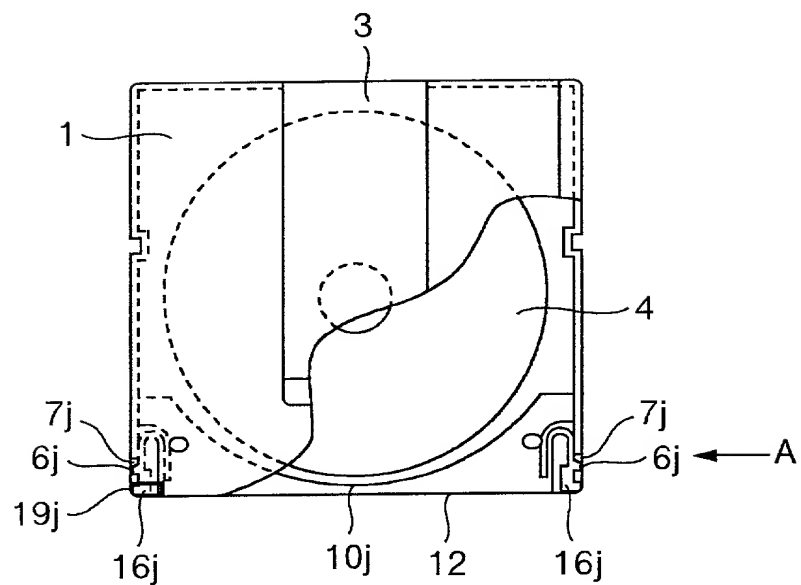


FIG.5A

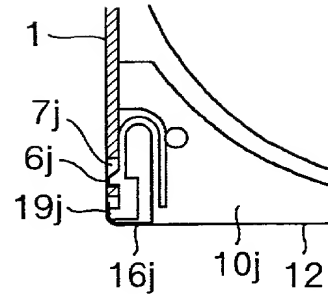
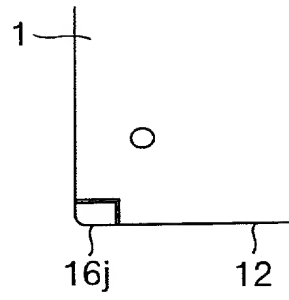


FIG.5B

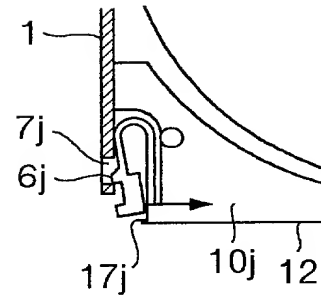
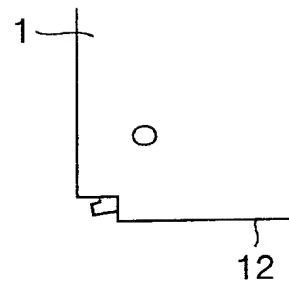


FIG.5C

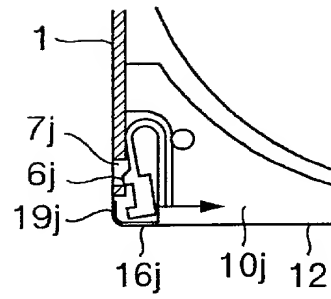
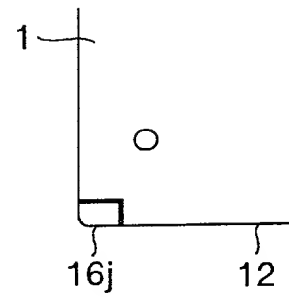


FIG.6A

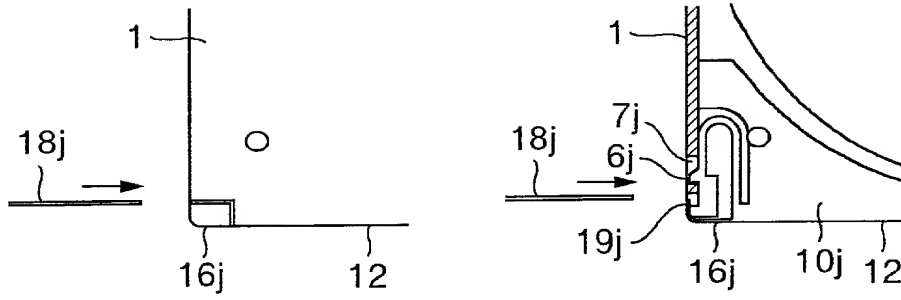


FIG.6B

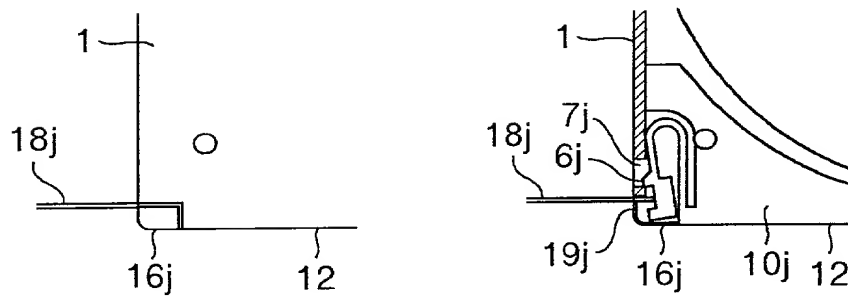


FIG.7A

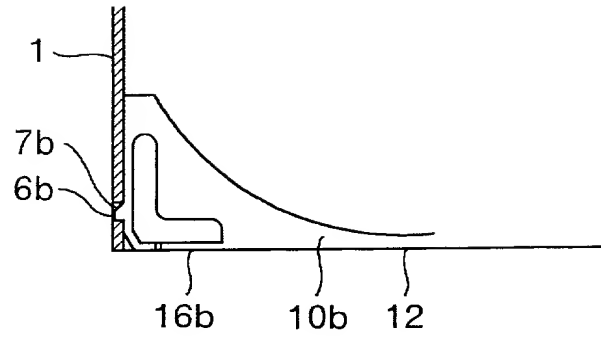


FIG.7B

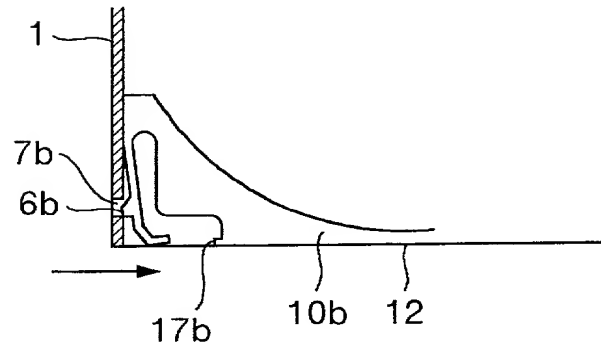


FIG.7C

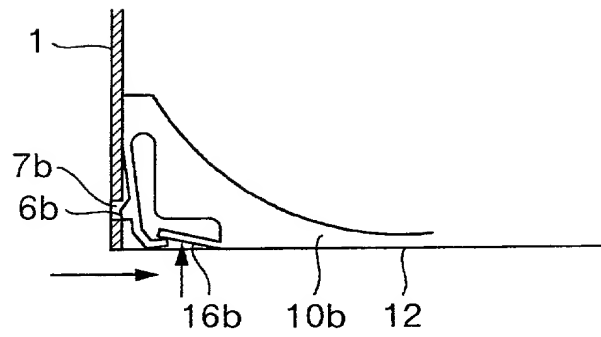


FIG.8A

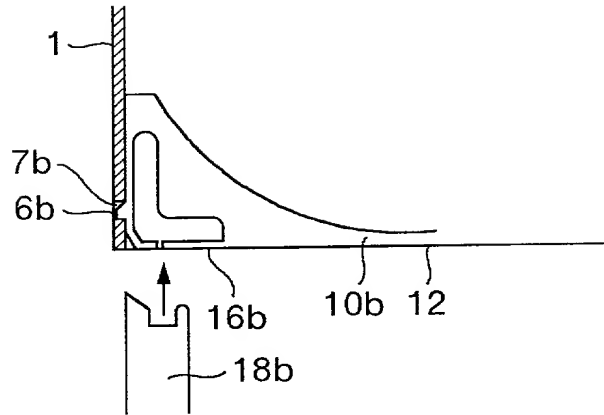


FIG.8B

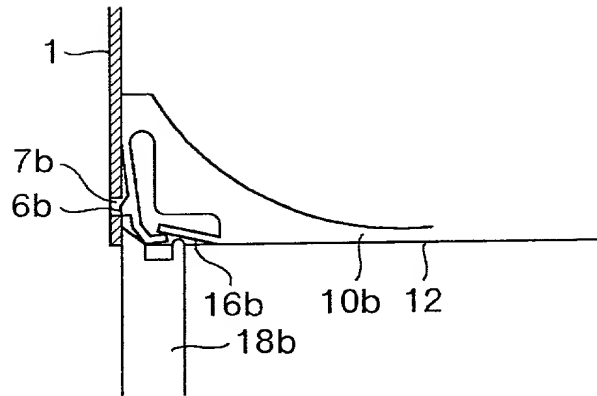


FIG.9
PRIOR ART

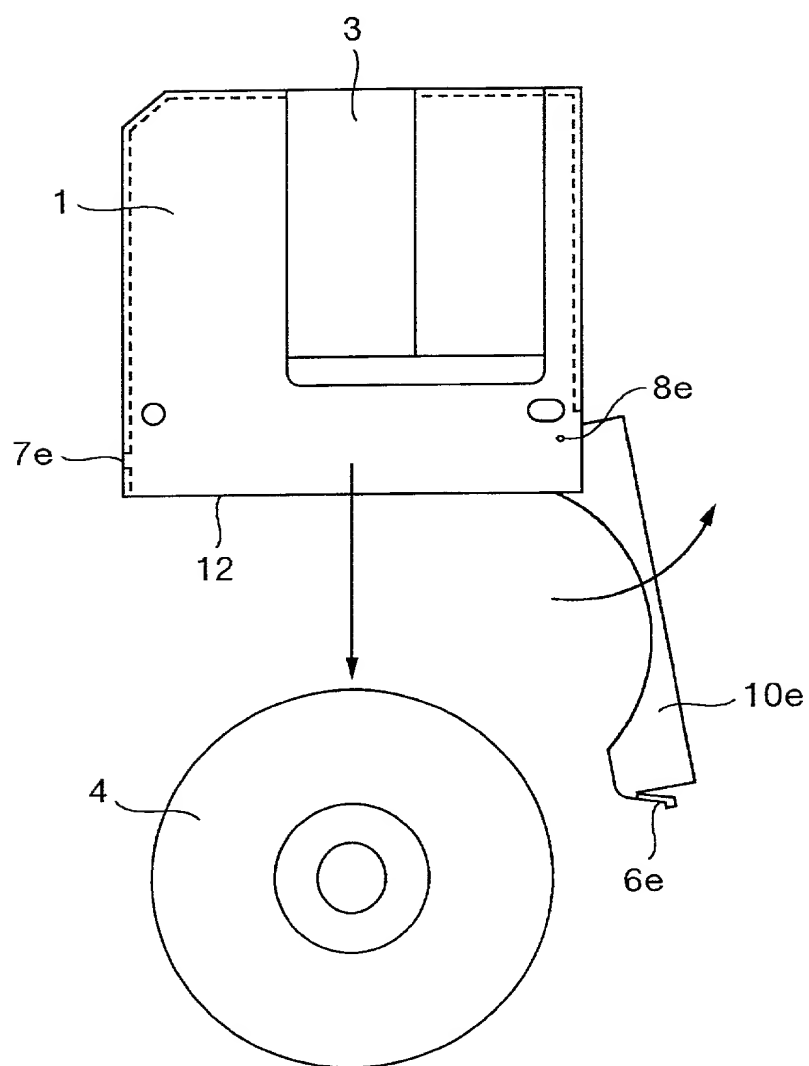


FIG.11
PRIOR ART

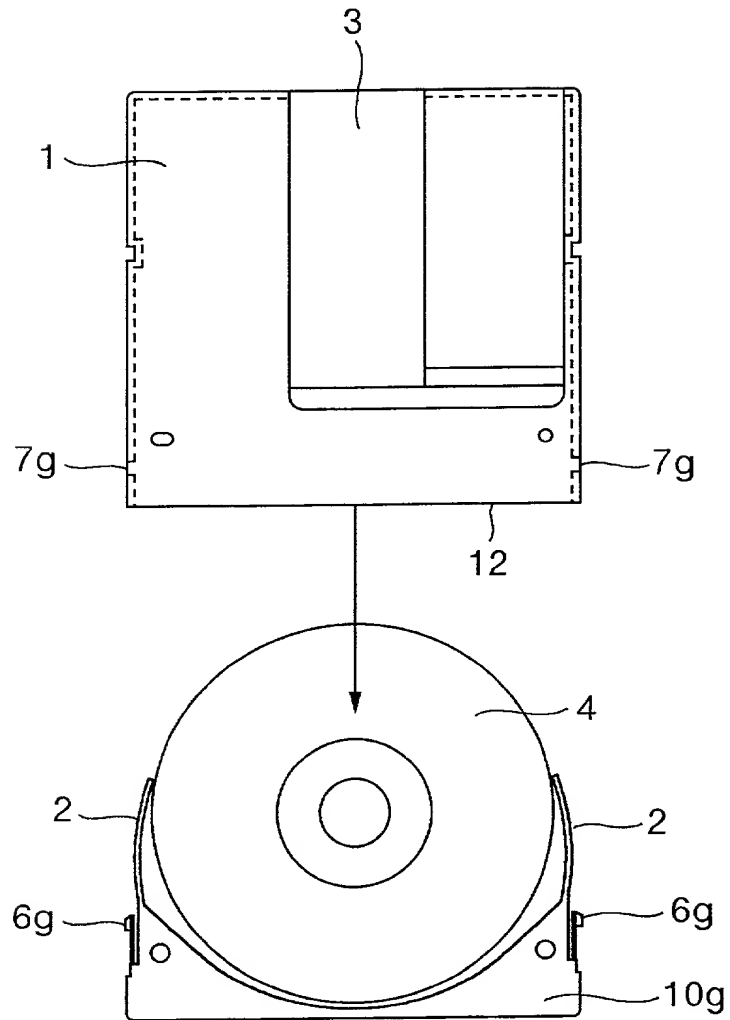


FIG.12
PRIOR ART

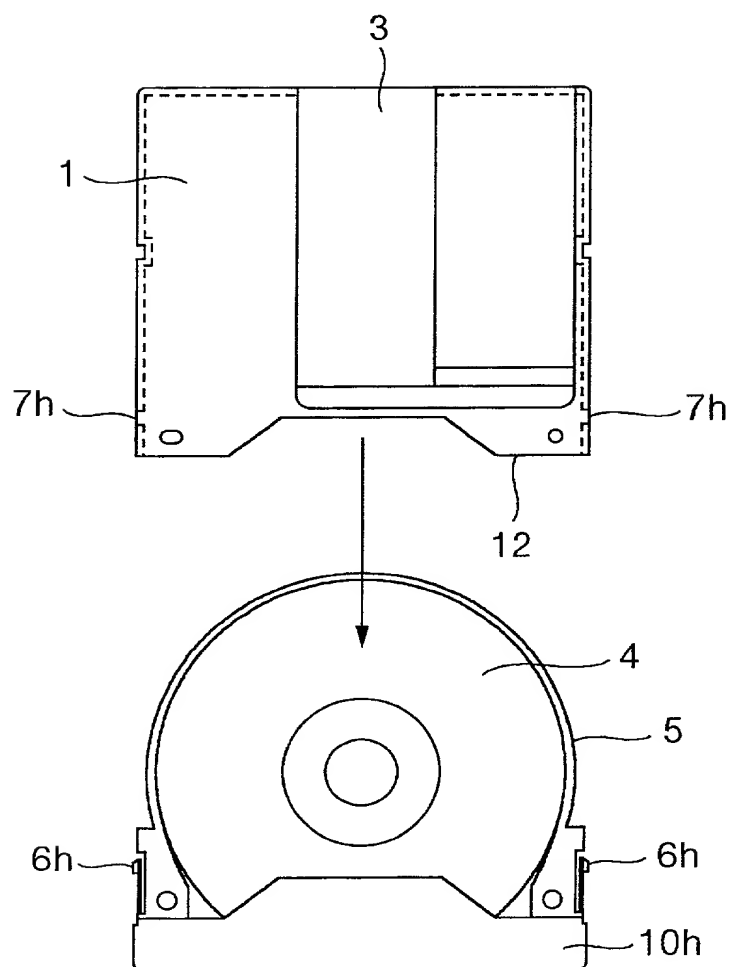
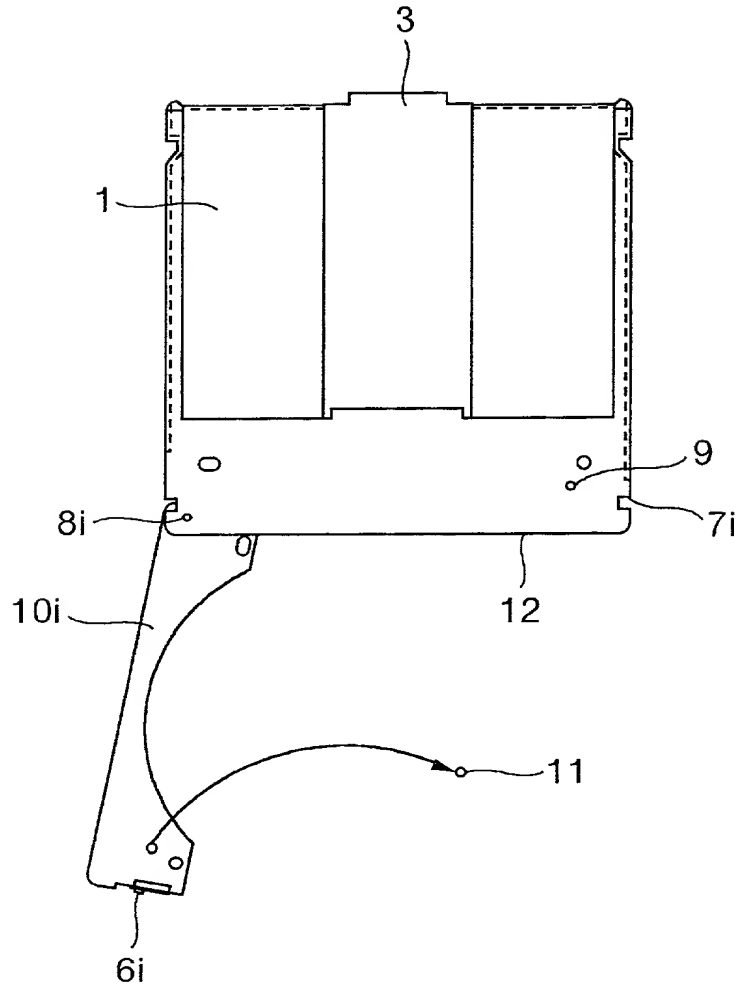


FIG.13
PRIOR ART



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(*)

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"DISC CARTRIDGE"

the specification of which (check one)

☒

is attached hereto.

☐

was filed on _____

as Application Serial No. _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

10-118111 (Number)	Japan (Country)	28 April, 1998 (Day/Month/Year Filed)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
10-054701 (Number)	Japan (Country)	6 March, 1998 (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)

(Continued on Page 2)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United State Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Residence _____	Citizenship _____	
Post Office Address _____		
Date _____	Inventor _____	
Residence _____	Citizenship _____	
Post Office Address _____		
Date _____	Inventor _____	
Residence _____	Citizenship _____	
Post Office Address _____		
Date _____	Inventor _____	
Residence _____	Citizenship _____	
Post Office Address _____		